

CLAIMS

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a1* We claim:

1. A computer readable medium having stored thereon a computer executable compiler system that performs semantic analysis of definition language information embedded in programming language code in a file, the compiler system comprising:

a front end module that separates a file into plural tokens, the file including programming language code having embedded therein definition language information;

a converter module that converts the plural tokens into an intermediate representation;

a back end module that produces output code from the intermediate representation based at least in part upon semantics of the embedded definition language information.

2. The compiler system of claim 1 wherein the intermediate representation includes a symbol table and a parse tree that unifies representation of the programming language code and the embedded definition language information.

3. The compiler system of claim 2 wherein the symbol table includes plural entries for symbol names for the programming language code, and wherein

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at least one of the plural entries has an associated list of definition language attributes.

4. The compiler system of claim 1 further comprising a definition language attribute provider that modifies the intermediate representation based upon the semantics of the embedded definition language information.

5. The compiler system of claim 1 further comprising an error checker module that checks for lexical, syntactic, and semantic errors in the file.

6. In a computer system, a computer executable compiler system that creates a unified programming language and interface definition language parse tree from a file comprising a mix of programming language constructs and interface definition language constructs, the compiler system comprising:

a front end module that separates a file into plural tokens, the file comprising a mix of programming language constructs and interface definition language constructs;

a converter module that converts the plural tokens into an intermediate representation comprising a symbol table and a parse tree, wherein the symbol table includes plural entries for symbol names for the programming language constructs, at least one of the plural entries having an associated list of interface definition language attributes, and wherein the parse tree unifies representation of

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the programming language constructs and the interface definition language constructs.

7. The compiler system of claim 6 wherein the front end module recognizes a delimiting character that distinguishes interface definition language tokens from programming language tokens.

8. The compiler system of claim 6 further comprising an error checker module that performs lexical and syntactic checks on the file.

9. A computer readable medium having stored thereon a data structure representing a unified interface definition language and programming language parse tree for a file having a combination of programming language code and embedded interface definition language information, the data structure comprising:

a first data field storing data representing a symbol table that has plural entries, each of the plural entries corresponding to a symbol name for programming language code of a file having a combination of programming language code and embedded interface definition language information, at least one of the plural entries having an associated list of interface definition language attributes based upon the embedded interface definition language information; and

a second data field storing data representing a parse tree, wherein the parse tree unifies representation of the programming language code and the embedded interface definition language information.

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10. In a computer system, a method of creating a binary file from an input file that includes a mix of programming language constructs and definition language constructs, the method comprising:

providing one or more input files, each input file comprising a mix of programming language constructs and definition language constructs;

upon user initiation at compile time, creating a binary file from the one or more input files, wherein the creation of the binary file comprises:

with a compiler, converting the one or more input files into one or more output code files that include fragments of definition language information; and

with a linker, generating a binary file from the one or more output code files.

11. The method of claim 10 wherein the generating comprises:

extracting the fragments of definition language information from the one or more output code files;

passing the extracted fragments to the compiler;

generating by the compiler an intermediate definition language file;

based upon the intermediate definition language file, generating by a definition language compiler a type library file; and

producing the binary file based upon the one or more output code files and the type library file.

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12. The method of claim 11 wherein the producing comprises:
embedding the type library file into a first intermediate resource file;
with a resource tool, generating a second intermediate resource file;
with a resource file combiner, combining the second intermediate resource
file with one or more related resource files into a combined resource file; and
producing the binary file based upon the one or more output code files and
the combined resource file.

13. In a computer system, a method of deriving semantic meaning from
definition language information embedded in programming language code in a file,
the method comprising:

separating a file into plural tokens, the file including definition language
information embedded in programming language code;
converting the plural tokens into an intermediate representation;
generating output code from the intermediate representation based at least
in part upon semantics of the embedded definition language information.

14. The method of claim 13 wherein the converting comprises:
building a symbol table having plural entries for symbol names for the
programming language code, at least one of the plural entries having an
associated list of definition language attributes based upon the embedded
definition language information; and

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building a parse tree that unifies representation of the programming language code and the embedded definition language information.

15. The method of claim 13 further comprising:

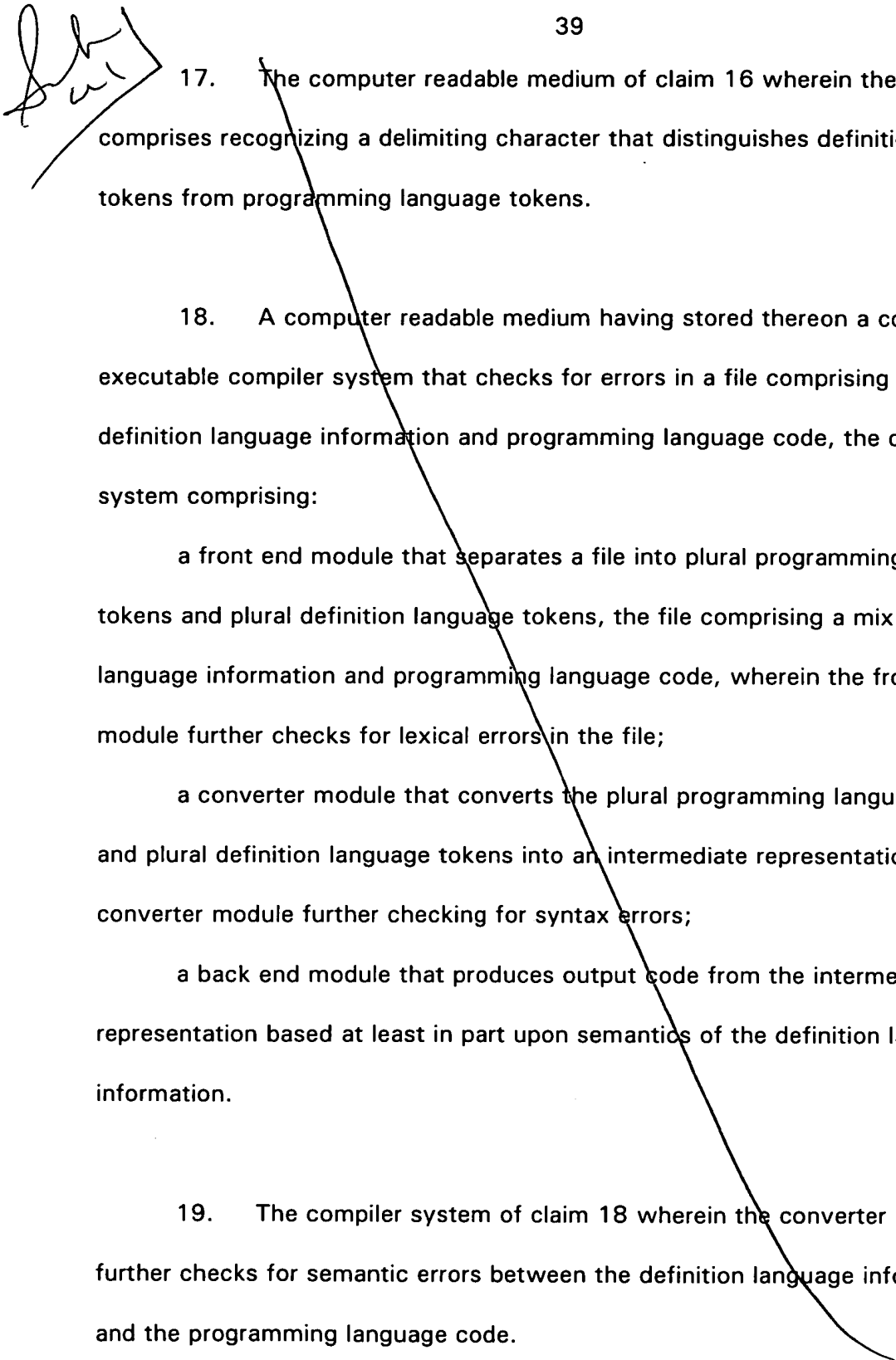
modifying the intermediate representation by a definition language attribute provider based upon the semantics of the embedded definition language information.

16. A computer readable medium having stored thereon instructions for performing a method of creating a unified programming language and definition language parse tree from a file that includes definition language information embedded in programming language code, the method comprising:

separating a file into plural tokens, the file including definition language information embedded in programming language code;

building a symbol table having plural entries for symbol names for the programming language code, at least one of the plural entries having an associated list of definition language attributes based upon the embedded definition language information; and

building a parse tree that unifies representation of the embedded definition language information and the programming language code.



17. The computer readable medium of claim 16 wherein the separating comprises recognizing a delimiting character that distinguishes definition language tokens from programming language tokens.

18. A computer readable medium having stored thereon a computer executable compiler system that checks for errors in a file comprising a mix of definition language information and programming language code, the compiler system comprising:

a front end module that separates a file into plural programming language tokens and plural definition language tokens, the file comprising a mix of definition language information and programming language code, wherein the front end module further checks for lexical errors in the file;

a converter module that converts the plural programming language tokens and plural definition language tokens into an intermediate representation, the converter module further checking for syntax errors;

a back end module that produces output code from the intermediate representation based at least in part upon semantics of the definition language information.

19. The compiler system of claim 18 wherein the converter module further checks for semantic errors between the definition language information and the programming language code.

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20. In a computer system having a programming language compiler that generates output code based upon programming language source code, the programming language compiler including a compiler state, a symbol table, and a parse tree, an improvement comprising:

modifying the programming language compiler to recognize constructs of interface definition language information embedded within programming language source code;

modifying the programming language compiler to expose the compiler state to one or more interface definition language attribute providers;

modifying the programming language compiler to allow manipulation of the symbol table and the parse tree by the one or more interface definition language attribute providers based upon the semantics of the embedded interface definition language information.

21. In a computer system, a method of embedding debugging information in a definition language output file to facilitate debugging of an input file, the input file comprising constructs of definition language information embedded in programming language code, the method comprising:

receiving by a programming language compiler an input file, the input file comprising constructs of definition language information embedded in programming language code;

embedding by the programming language compiler debugging information
in a definition language output file, the definition language output file for

